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Veröffentlichungsversion / Published Version
Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:
Filho, A. C. A. d. A., Almeida, P. D., Araújo, A. K. L. d., Sales, I. M. M., Araújo, T. M. E. d., & Rocha, S. S. d. (2017). Epidemiological profile of Diabetes Mellitus in a northeastern brazilian state. *Revista de Pesquisa: Cuidado é Fundamental Online*, *9*(3), 641-647. https://doi.org/10.9789/2175-5361.2017.v9i3.641-647

REVISTA ONLINE DE PESQUISA

CUIDADO É FUNDAMENTAL

Universidade Federal do Estado do Rio de Janeiro • Escola de Enfermagem Alfredo Pinto

RESEARCH

DOI: 10.9789/2175-5361.2017.v9i3.641-647

Perfil epidemiológico do Diabetes *Mellitus* em um estado do nordeste brasileiro

Epidemiological profile of Diabetes *Mellitus* in a northeastern brazilian state

Perfil epidemiológico de la Diabetes *Mellitus* en un estado del nordeste de Brasil

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How to quote this article:
Filho ACAA; Almeida PD; Araújo AKL; et al. Epidemiological profile of diabetes mellitus in a northeastern brazilian state. Rev Fund Care Online. 2017 jul/set; 9(3):641-647. DOI: http://dx.doi.org/10.9789/2175-5361.2017.v9i3.641-647

ABSTRACT

Objective: To describe the epidemiological profile of Diabetes Mellitus in Piauí State, in the Northeastern region of Brazil, between 2002 and 2012. **Methods:** An epidemiological study, with retrospective collection. Secondary data were used from HiperDia, system available in the DATASUS. **Results:** There were recorded 8551 cases, of which 75.4% of type 2 and 24.6% of type 1. In all the years of the study, the largest number of cases occurred in the age group of 40 to 59 years old, both the type 1 and type 2. The female gender was the most affected by the disease (60.37%). From the associated comorbidities, the one that presented a higher frequency was kidney disease both in patients with DM type 1 (3.4%), as in patients with type 2 DM (2.2%). **Conclusion:** The knowledge of the epidemiological profile is essential for the development of more effective health actions geared to the reality of DM in Piauí State, in the Northeast of Brazil.

Descriptors: Diabetes *Mellitus,* Health Profile, Epidemiology, Nursing.

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RESUMO

Objetivo: Descrever o perfil epidemiológico do Diabetes *Mellitus* no estado do Piauí, Brasil, entre 2002 e 2012. **Métodos:** Estudo epidemiológico, com coleta retrospectiva. Foram utilizados dados secundários do Sistema Hiperdia, disponíveis no Datasus. **Resultados:** Foram registrados 8.551 casos, dos quais, 75,4% do tipo 2 e 24,6% do tipo 1. Em todos os anos do estudo, o maior número de casos ocorreu na faixa etária de 40 a 59 anos, tanto no tipo 1 quanto no tipo 2. O sexo feminino foi o mais acometido pela doença (60,37%). Das comorbidades associadas, a que apresentou maior frequência foi a doença renal tanto em pacientes com DM tipo 1 (3,4%), quanto em pacientes com DM tipo 2 (2,2%). **Conclusão:** O conhecimento do perfil epidemiológico é essencial para o desenvolvimento de ações de saúde mais efetivas e voltadas à realidade do DM no estado do Piauí. **Descritores:** Diabetes *Mellitus*, Perfil de saúde, Epidemiologia, Enfermagem.

RESUMEN

Objetivo: Describir el perfil epidemiológico de la Diabetes Mellitus en el Estado de Piauí, Brasil, entre 2002 y 2012. **Métodos:** Un estudio epidemiológico con la colección retrospectiva. Se utilizaron el sistema de datos disponibles en HIPERDIA lado DATASUS. **Resultados:** Se registraron 8.551 casos, de los cuales 75,4% del tipo 2 y el 24,6% tipo 1. En todos los años de estudio, el mayor número de casos se produjo en el grupo de edad 40-59 años, tanto en tipo 1 y tipo 2. La hembra fue el más afectada por la enfermedad (60,37%). De las comorbilidades asociadas, la que presentó una frecuencia más alta era tanto la enfermedad renal en pacientes con DM tipo 1 (3,4%) y en pacientes con diabetes tipo 2 (2.2%). **Conclusión:** El conocimiento del perfil epidemiológico es esencial para el desarrollo de acciones de salud más eficaces y dirigidas a la realidad de DM en el estado de Piauí. **Descriptores:** Diabetes *Mellitus*, Perfil de Salud, Epidemiología, Enfermería.

INTRODUCTION

Diabetes *Mellitus* (DM) is a chronic disease that is currently configured as a worldwide epidemic and big challenge for health systems in all countries, whether developed or not. Some factors are responsible for the increased incidence and prevalence of diabetes worldwide, such as an aging population, increasing urbanization, the adoption of unhealthy lifestyles (sedentary lifestyle, poor nutrition and obesity).[1,2]

DM shows high mortality and significantly reduces the quality of life of individuals, because it interferes in all aspects of life.[3] Its chronic condition imposes changes in life habits, such as consumption of balanced diet, physical activity and use of drug therapy. Such measures help to maintain a good metabolic control.[4]

It is a major cause of kidney failure, lower limb amputations, blindness and cardiovascular disease. Thus, the priority for public health has been the prevention of diabetes and its complications, as this disease causes great expense not only for the affected individuals and their families but also for the health system.[5,3]

In 2014, DM accounted for 11% of total world spending on the health of adults, with an estimated cost of 612 million dollars and still causing 4.9 million deaths worldwide in the same year.[6] In Brazil, this disease represents 5.2% of the causes of deaths and mainly affects vulnerable populations such as the elderly and people with low income and education.[7] In 2011, DM resulted in Brazil 5.3% of deaths, with a mortality rate of 33.7 deaths per 100,000 inhabitants. In 2010, the mortality rate for acute complications was 2.45 deaths per 100 thousand inhabitants, of 0.29 per 100,000 inhabitants among children under 40 years of age.[6] In addition, attributable hospitalizations to DM represent 9% of hospital expenses of the Brazilian health system.[2]

It is estimated that worldwide more than 180 million people have diabetes and this number is likely to more than double by 2030, according to estimates of the World Health Organization (WHO). In this perspective, Brazil will present approximately a population of 11.3 million people with diabetes, and this increase will occur mainly in older age groups, in which half of the population affected ignore this diagnosis.[8-9] In Brazil, it is estimated that about 5% of the adult population has DM, affecting approximately 7% of the population between 30 and 69 years and 18% over 65 years.[7] The prevalence in Brazil is high, corresponding to 7.6% in individuals 30-69 years of age.[9]

It is noteworthy that the 1996-2009 period, Brazil, as well as Piaui state, increased mortality rate for diabetes. It is noteworthy that in 2006 this rate in Piaui, exceeded the values of the Northeast and Brazil.[10]

Facing the reality in national and international level, which it is estimated the increase in the number of cases of DM, and still face the lack of studies that address the reality of Piaui, this study aims to describe the epidemiological profile of patients with Diabetes *Mellitus* in Piaui State, Brazil, between 2002 and 2012.

METHODS

This is an epidemiological study with retrospective collection from secondary data from Hiperdia, a program of Piaui state, provided by the Department of the Unified Health System (Datasus) from the period of 2002 to 2012 (n = 8,551). This time interval was determined to cover the period in which the data are complete, since after this period was initiated to system deployment e-SUS, which had not yet been completed by the time of the survey. Piaui has an area of 251.611,932 Km², with 224 cities and a population of 3,118,360 people.

Data were exported in October 2015, considering the variables related to the characterization of the population (gender and age), year, type of diabetes and complications. The study population consists of all registered cases and entered in Hiperdia in Piaui state, from 2002 to 2012. Tabulation of data occurred from TABNET program then exported and analyzed in Excel from performing calculations of simple absolute frequencies, percentages and univariate techniques presented in tables.

This study was not submitted to the Research Ethics Committee in Human Beings (CEP), given that it is the use of data available in a public domain database. However, it is noteworthy that during the search were observed aspects contained in the Resolution of the National Health Council (CNS) No 466/12, which regulates research involving human subjects.

RESULTS

In the analyzed period were recorded 8,551 cases, with a predominance of type 2 DM (75.4%). In relation to type 1 DM, there were 2,105 cases between 2002 and 2012. The year 2002 had the highest number of recorded cases of type 1 diabetes, with 406 new cases. Regarding age, the highest frequency was between 40 to 59 years (40.4%), followed by patients aged over 60 years (30.5%) (Table 1).

Table 1 - Distribution of new cases of type 1 Diabetes *Mellitus*, by age group and year in Piauí state, from 2002-2012

Year	Up to 19 years old		20 to 39 years old		40 to 59 years old		≥ 60 years old		Total
	n	%	n	%	n	%	n	%	N
2002	39	9.6	78	19.2	148	36.5	141	34.7	406
2003	12	10.0	28	23.3	48	40.0	32	26.7	120
2004	12	11.7	21	20.4	39	37.9	31	30.1	103
2005	20	8.8	31	13.7	96	42.5	79	35.0	226
2006	07	3.8	34	18.4	81	43.8	63	34.1	185
2007	13	7.7	39	23.1	68	40.2	49	29.0	169
2008	17	8.8	37	19.2	86	44.6	53	27.5	193
2009	23	9.7	55	23.3	99	41.9	59	25.0	236
2010	21	11.4	38	20.7	68	37.0	57	31.0	184
2011	11	7.9	35	25.2	60	43.2	33	23.7	139
2012	13	9.0	29	20.1	57	39.6	45	31.3	144
Total	188	8.9	425	20.2	850	40.4	642	30.5	2105

Source: Ministry of Health - System Registration and Monitoring of Hypertensive Diabetics. Exported data in September 2015, subject to change.

In relation to type 2 diabetes, it was observed that were recorded 6,446 cases more frequently in 2002 (24.88%), being the age group between 40 and 59 years the most affected one, with 3,282 registered cases (50.9 %) (Table 2).

Table 2 - New cases of distribution of type 2 diabetes, by age and year of occurrence in Piauí State, from 2002-2012

Year	Up to 19 years old		20 to 39 years old		40 to 59 years old		≥ 60 years old		Total
	n	%	n	%	n	%	n	%	N
2002	10	0.6	165	10.3	826	51.5	603	37.6	1604
2003	02	0.6	29	8.5	156	45.9	153	45.0	340
2004	01	0.3	33	11.0	154	51.5	111	37.1	299
2005	04	0.7	76	12.5	301	49.3	229	37.5	610
2006	04	0.9	55	12.6	207	47.4	171	39.1	437
2007	01	0.2	80	14.6	285	52.0	182	33.2	548
2008	08	1.4	88	14.9	309	52.2	187	31.6	592
2009	07	1.1	94	14.9	319	50.6	210	33.3	630
2010	03	0.6	88	17.8	272	55.2	130	26.4	493
2011	04	0.9	74	16.5	222	49.6	148	33.0	448
2012	01	0.2	79	17.8	231	51.9	134	30.1	445
Total	45	0.7	861	13.4	3282	50.9	2258	35.0	6446

Source: Ministry of Health - System of Registration and Monitoring of Hypertensive Diabetics. Data exported in October 2015.

It was observed that women had a higher number of reported cases of DM, with 5,162 (60.37%). Regarding the type of DM, it was observed that both type 1 and type 2, the female also recorded the highest number of cases, respectively, in 1,218 (57.86%) and 3,944 (61.19%) (Table 3).

Table 3 - New Cases of Diabetes *Mellitus* by type and by gender in Piauí state, from 2002-2012

Gender	Diabetes *Mellitus* 1		Diabetes *Mellitus* 2		Total	
	n	%	n	%	N	%
Male	887	42.14	2502	38.81	3389	39.63
Female	1218	57.86	3944	61.19	5162	60.37
Total	2105	100.0	6446	100.0	8551	100.0

Source: Ministry of Health - System of Registration and Monitoring of Hypertensive Diabetics. Data exported in October 2015.

It was observed during the study period, most people with type 1 DM and type 2 DM were not smokers, with a frequency of, respectively, 82.8% and 82.3%. It was also found that most of them were not sedentary, respectively, 69.2% and 57.1%, and did not appear to be overweight, with 80.5% (type 1) and 66.2% (type 2).

Table 4 - New cases of Diabetes *Mellitus* by type and risk factors in Piauí state, from 2002-2012

Variables	Diabetes Mellitus 1				Diabetes Mellitus 2			
	Yes	%	No	%	Yes	%	No	%
Smoking	363	17.2	1742	82.8	1144	17.7	5302	82.3
Sedentary lifestyle	648	30.8	1457	69.2	2766	42.9	3680	57.1
Overweight	410	19.5	1695	80.5	2180	33.8	4266	66.2

Source: Ministry of Health - System of Registration and Monitoring of Hypertensive Diabetics. Data exported in October 2015.

Regarding the complications associated with DM, it presented the highest frequency was kidney disease both in cases with type 1 DM and in those with type 2 diabetes, 3.4% and 2.2%, respectively. Stroke had similar frequency of renal disease in patients with type 2 diabetes (2.2%). It was observed that the diabetic foot rate was 3.1% in patients with type 1 DM and 2.0% in patients with type 2 DM.

Table 5 - Frequency of new cases of Diabetes Mellitus by type and occurrence of complications in the state of Piauí, from 2002-2012

Complications	Diabetes *Mellitus* 1				Diabetes *Mellitus* 2				Total			
	Yes	%	No	%	Yes	%	No	%	Yes	%	No	%
Kidney disease	72	3.4	2033	96.6	145	2.2	6301	97.8	217	2.5	8334,0	97.5
Stroke	48	2.3	2057	97.7	142	2.2	6304	97.8	190	2.2	8361,0	97.8
Acute myocardial infarction	34	1.6	2071	98.4	61	0.9	6385	99.1	95	1.1	8456,0	98.9
Diabetic foot	66	3.1	2039	96.9	126	2.0	6320	98.0	192	2.2	8359,0	97.8
Amputation of the Diabetic Foot.	39	1.9	2066	98.1	81	1.3	6365	98.7	120	1.4	8431,0	98.6

Fonte: Ministério da Saúde - Sistema de Cadastramento e Acompanhamento de Hipertensos e Diabéticos. Dados exportados em outubro de 2015.

DISCUSSION

Among the 8,551 studied cases were found 75.4% of type 2 diabetics, which corresponds to a percentage lower than found in international level that is 90%, while the type 1 is found in only 8%.[11]

Regarding age, it was observed that the higher prevalence of DM is between the age group of 40-59 years and individuals aged over 60 years. This finding is justified by the aging process experienced by brazilian population, which causes physiological changes in metabolism and by adopting a few healthy habits (poor diet and physical inactivity, for example) as well.[6] In regard of this, we emphasize the need to make plans about the care that should be directed to the population served by health professionals, taking into account their socio-demographic characteristics and comorbidities, offering ways to promote metabolic control.[12]

The female predominance among patients with DM was found in other studies[4,1], an example is the case study in a Family Health Unit located in the urban area of the city of João Pessoa, in which 67.1% of DM it was female.[4] This result can be explained by the fact that women reach adulthood and aging more often, if compared to men, added to the event that women are more concerned with health and have greater accessibility to health services, causing them to be diagnosed earlier than men.[9,4]

It is known that reduced search for health services by men happens due to the difficulties in assuming that they are sick, under the argument that they have to work, and also due to sexism. In this sense, it is observed that such attitude has reflected negatively upon men's health, where there is an increase in the number of hospitalizations caused by various chronic morbidities, which have treatment and may be accompanied by the Primary Health Care.[9] It is important to note that individuals who are affected by DM already have pronounced risks of hospitalizations and even repeated compared to those without the disease. This fact directly affects the quality of life and generates high costs to health services.[13]

It is known that diabetic complications are composed of macrovascular (coronary artery disease, cerebrovascular disease and peripheral vascular disease) and microvascular (retinopathy, nephropathy and neuropathy).[14] Concerning the complications of diabetes, it was observed that the study population presented both macrovascular and microvascular. Kidney disease showed the highest percentage with 2.5% of cases. This rate, in turn, was greater than that of a study in Salvador/BA (1,6%);[1] and lower than that found in a study conducted in Cuiabá/MT (9.9%)[15].

As for the diabetic foot, the frequency found in this study was lower than the produced ones in Salvador/BA,[1] Cuiabá/MT[15] and in Pelotas/RS[16], which frequencies were 2.5%, 4.3% and 6.9%, respectively. It is estimated that approximately 15% of patients with DM will develop some injury to the feet throughout life, so it is considered to be one of the most serious complications, since it is responsible for 40% to 60% of lower members' amputation cases.[14,1]

Cardiovascular complications consists of a leading cause of morbidity and mortality associated with DM. In this study, stroke showed a rate of 2.2%, higher than that seen in a study developed in Salvador/BA, 1.8%[1], and lower than that found in Cuiabá/MT, 8 0%.[15]

Such complications reduce the quality of life of affected individuals and entail disabilities to fulfill daily activities. Also, they have a high rate of morbidity and mortality, especially in combination with other factors such as hypertension, smoking and dyslipidemia. In DM, the failure to carry out activities related to self-care, such as those related to proper nutrition, physical activity and proper use of medications, when necessary, exacerbates the onset of complications.[14,12]

In this perspective, it becomes fundamental to qualify health professionals in order to improve the care provided to patients with DM, seeking to implement preventive measures in order to improve control of the disease and thus prevent complications and help to improve individuals' quality of life. Thus, it is necessary that health professionals develop promotion and health prevention actions, offering people living with diabetes, information about the disease, warning about the complications of diabetes, and also self-care actions related primarily to the adoption of healthier lifestyles in order to provide a more appropriated self-care.[1,13]

Educational practices in health in this context recognize the importance of new strategies that prioritize the autonomy of individuals with DM and conscious decision-making managers of their own health[3], in which the attention to DM should return for the provision of clinical and educational interventions informed by scientific evidence.[17]

Health education, offered by primary care services is one strategy that helps to decrease the high prevalence of complications in people with diabetes that get worse due to the lack of self-care realization, especially in aspects related to proper nutrition, physical exercise and proper use of antidiabetic medication, when prescribed. They should approach global perceptions about the disease, facilitating the development of self-care skills, and helping the patient himself and his/her family to cope with the illness.[3,12,1]

For this, health professionals need to provide knowledge and strengthen active attitudes towards the disease, directing them to DM and family, and also approaching the same so that they feel free to express their doubts, difficulties and conflicts, and they can have better understanding about the disease and the importance of the implementation of self-care.[3,18]

It is known that, in order to develop actions aimed at self-care in DM is necessary to have knowledge about the disease. However, behavior change is not necessarily linked to the acquisition of knowledge, as the lifestyle and beliefs can also have a strong influence.[3] Personal, cultural and socio-economic factors can favor the low adherence to self-care activities.[19]

It is important the development and implementation of research activities and monitoring of users by Family Health Strategy's health professionals. In addition, the incorporation of health education activities need to happen from the health practices developed in primary care, either through home visits, lectures, medical and nursing consultations, because such practices promote adherence to treatment.[20]

As the DM remain asymptomatic in the initial course before its diagnosis, these actions make it easier to make an early diagnosis, and consequently reduce its complications, ie, those actions are essential, since the control of this disease is directly associated with linkages to the patient users of health facilities and professionals who work there. Only then, they will have to do the tracking and monitoring of the evolution of DM, adapting to each patient an individual and quality assistance to the burden of disease is reduced.[8]

CONCLUSION

The analysis of Hiperdia database allowed the identification of the epidemiological situation of Diabetes *Mellitus* in Piaui state, from the affected population characteristics, the factors associated with increased severity of the disease, and the most prevalent consequences. It is worth noting that research findings showed low rates of complications caused by diabetes. However, such information is relevant, given the severity of the problem, and the consequences for affected people's lives, and how these complications affect directly their quality of life.

It is noteworthy that nurses should create mechanisms to promote better adherence to treatment through the implementation of actions that allow increased knowledge of the population about the DM complications' prevention, providing affected individuals self-care guidelines that resonate in improving their quality of life and reducing morbidity and mortality from this disease's complications.

Therefore, it is considered that epidemiological profile's knowledge become an important tool for health professionals, with a view that aids directed health actions development to DM reality in Piaui state.

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Received on: 27/04/2016
Reviews required: No
Approved on: 19/09/2016
Published on: 10/07/2017

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